

Physico-chemical nanomaterials science

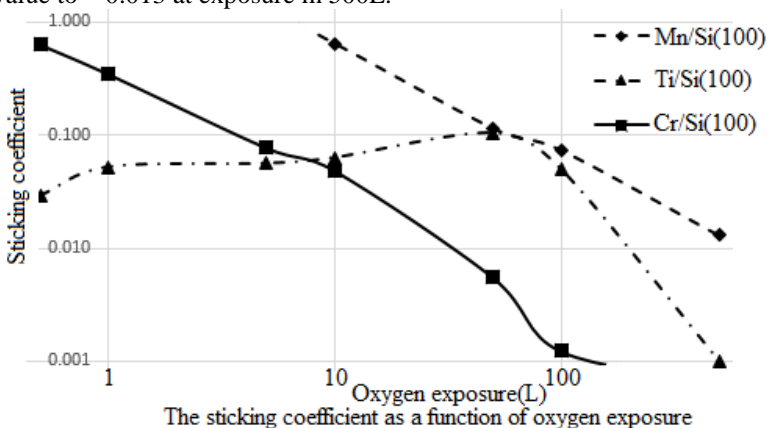
The oxidation of 1ML of transitional metal film on Si(001)

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The early stages of the interaction of molecular oxygen with the Si(001) surface, which was covered with a transitional metal (Cr, Ti, Mn) submonolayer film have been investigated. Also the sticking coefficient for molecular oxygen on such systems and chemical composition of manganese submonolayer film depending on exposure of oxygen were estimated. We got the giant increasing of sticking coefficient for such systems in comparison with pure silicon surface. We found that the rate of oxidation enhancement correlates with differences between of enthalpies of formation for the transition metal oxides and the silicon dioxide [2].

The maximum value of the sticking coefficient for the Mn/Si(001) occurs during exposure to 1L and is the order of unity, then there is a gradual decrease of the value to ~ 0.013 at exposure in 500L.



It is clearly seen that the initial oxidation rate for the silicon surface with transitional metal submonolayer decrease from Mn and Cr to Ti.

1. K.O. Butariev, I.F. Koval, Yu.A. Len, M.G. Nakhodkin. Influence of annealing on the formation and the kinetics of oxidation the interface silicide/Si(001) // Bulletin of University of Kyiv Series: Physics & Mathematics. – 2012. – №4. – P.239 – 242.